L 34524-65

ACCESSION NR: AP5005900

The values obtained for methane, hydrogen, gasoline, or ethyleneglycol diethylether corresponded generally with published data, while the minimum ignition temperature of 180C for carbon disulfide and ethyl ether was markedly lower than the T_s > 770C measured for flowing gas. The minimum T_s = 420C for acetylene-air is also considerably lower than the value of 700-800C reported for gas streams. The results are explained by a mechanism of degenerate chain branching, and by chemical conversion and cold flame generation prior to ignition. The ignition properties of carbon disulfide, ethyl ether and acetylene, the thermal ignition mechanism of the other studied compounds, and the dependence of the minimum ignition temperature upon composition is shown to correspond with published experimental data and theories. The type of igniter had little or no effect on T_s. The proposed two-stage mechanism was confirmed by a photographic study on the ignition of ethyl ether-air mixtures. Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 20Aug64 ENCL: 02 SUB CODE: FP

NO REF SOV: 012 OTHER: 012

Card 2/4

L 34524-65

ACCESSION NR: AP5005900

ENCLOSURE: 01

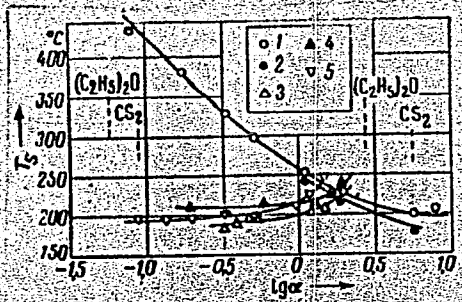


Fig. 1. Ignition temperatures of air mixtures of CS_2 and $(C_2H_5)_2O$. 1-CS_2, igniter (c); V = 73X liters; 2-the same, igniter (a); 3-$(C_2H_5)O$, igniter (b, c), V = 73 liters; 4-the same, V-17 l.; 5-the same, igniter (a); V = 73 liters.

Card 3/4

L 34524-65

ACCESSION NR: AP5005900

ENCLOSURE: 02

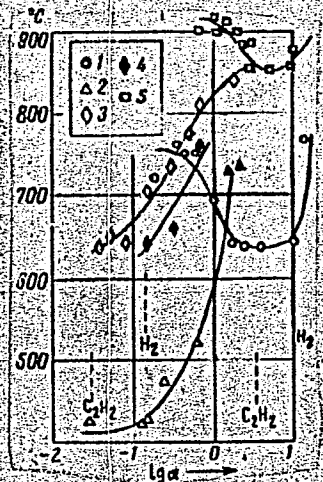


Fig. 2. The ignition temperature of air mixtures of C_2H_2, H_2, $(C_2H_5O)_2C_2H_4$, and gasoline B-70. V = 73 liters, igniter (d). 1-H_2; 2-C_2H_2; 3 - $(C_2H_5O)_2C_2H_4$; 4 - the same with mixing; 5 - gasoline B - 70.

Card 4/4

L 05389-67 EWT(l)/EWT(m)/EWP(j) WW/JW/JWD/WE/RM

ACC NR: AP6029764 (A) SOURCE CODE: UR/0414/66/000/002/0109/0110

AUTHOR: Zakaznov, V. F. (Moscow); Rozlovskiy, A. I. (Moscow); Strizhevskiy, I. I. (Moscow)

ORG: none

TITLE: Effect of gas motion on quenching limits of flames in narrow channels

SOURCE: Fizika goreniya i vzryva, no. 2, 1966, 109-110

TOPIC TAGS: combustion, flame quenching, flame control, heat theory

ABSTRACT: The effect of motion on the quenching limits of flames in narrow channels was studied at 1 atmosphere pressure, in 34-212 cm/sec range of the normal flame velocity (u_n), 0.37-10.0 mm range of the diameter of the flame quenching channels, and a wide range of thermal conductivity of the combustible mixtures. The object of the work was to examine the universality of the Ya. B. Zel'dovich gas combustion theory. Combustible mixture components CH_4, C_3H_8, H_2, C_2H_2, and C_2H_4 were used as air and oxygen served as oxidizing agents. It was found that the quenching limits, in all cases agreed well with those predicted by the Zel'dovich theory. Thus, it is concluded that the Zel'dovich theory is quite universal as it applies to the gas combustion in a stationary system as well as to combustion involving gas mixture motion in a narrow channel and internal turbulence in the gas mixture during the combustion process. Orig. art. has: 1 table.

SUB CODE: 21/ SUBM DATE: 24Dec65/ ORIG REF: 003/ OTH REF: 001

Card 1/1

L 07489-67 EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JW/JWD

ACC NR: AP6035824 SOURCE CODE: UR/0413/66/000/020/0030/0030

INVENTOR: Levin, G.-N. L.; Rozlovskiy, A. I.; Ryabtsev, I. I.; Lyakhovitskiy, M. Sh.; Rodin, Ye. P.

ORG: none

TITLE: Preparative method for nitrogen oxides. Class 12, No. 186984 [announced by the State Scientific Research and Planning Institute of the Nitrogen Industry and Products of Organic Synthesis (Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut azotnoy promyshlennosti i produktov organicheskogo sinteza)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 20, 1966, 30

TOPIC TAGS: nitrogen oxide, nitrogen oxide preparation, combustion product

ABSTRACT: An Author Certificate has been issued for a method of preparing nitrogen oxides from the elements by burning fuel gases in excess oxygen [percentage unspecified] followed by separation of the oxides from the cooled gaseous combustion products. To increase the rate of separation of the nitrogen oxides and the nitric oxide yield without increasing the combustion temperature, the process is conducted in two steps: 1) combustion with an oxygen concentration of 50—60%; and 2) after the separation of nitrogen oxides, the combustion is continued until the excess oxygen has been used up.

SUB CODE: 07,21/SUBM DATE: 09Aug65/ ATD PRESS: 5104

Card 1/1 UDC: 661.98:66.071.7

ACC NR: AP7000315 SOURCE CODE: UR/0413/66/000/022/0035/0035

INVENTOR: Levin, G-N. L.; Ryabtsev, I. I.; Rozlovskiy, A. I.; Rodin, Ye. P.; Sheyndlin, A. Ye.; Prokudin, V. A.; Pishchikov, S. I.; Chernov, I. A.

ORG: none

TITLE: Method of preparing nitrogen oxides. Class 12, No. 188486 [announced by the State Scientific-Research and Design Institute for the Nitrogen Industry and Organic Synthesis Products (Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut azotnoy promyshlennosti i produktov organicheskogo sinteza)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 22, 1966, 35

TOPIC TAGS: nitrogen oxide, tempering, alkali metal, magnetohydrodynamics, combustion chamber

ABSTRACT: A method has been introduced for preparing nitrogen oxides at high temperature and pressure. The method is based on burning fuel and air in a combustion chamber using a nozzle for injecting water into the reaction products and "stabilizing" the oxides. To upgrade the "stabilization" and raising the energy efficiency of the process, an addition of alkali metal salt is introduced in the

Card 1/2 UDC: 546.17-31.05

ACC NR: AP7000315

chamber and the reaction product, after the nozzle treatment, is channelled into a magnetohydrodynamic generator. [Translation] [KP]

SUB CODE: 07/SUBM DATE: 02Apr63/

Card 2/2

ROZLOVSKIY, A.I.; ROYZEN, I.S.; MEDVEDEVA, V.S.

Limits of the ignition of ethylene and oxygen mixtures with carbon dioxide additives. Khim. prom. 41 no.10:754-756 O '65. (MIRA 18:11)

BRANST, B.P.; MOLODNIY, A.I.; STRIZHEVSKIY, I.I.; KHAYLOV, V.S.

Explosion hazards of the mixtures of nitrogen oxides with combustible gases and vapors. Khim.prom. 41 no.4:39-44 Ap '65. (MIRA 18:8)

PONIZKO, T.A.; ROZLOVSKIY, A.I.

Low-temperature ignition of a mixture of fuel gases. Dokl. AN SSSR 160 no.3:654-657 Ja '65. (MIRA 18:3)

1. Submitted August 24, 1964.

ROZLOVSKIY, A.I.

Preventing the ignition of gases by heated objects. Khim. prom. 40 no.12:920-925 D '64. (MIRA 18:2)

L 55016-65 EWT(m)/EPE(c)/EPR/EWP(j)/T/EWA(c) Pc-4/Pr-4/Ps-4 RPL BW/WW/ JW/WE/RM

ACCESSION NR: AP5010550 UR/0064/65/000/004/0039/0044 662.769:614.838

AUTHORS: Brandt, B. B.; Rozlovskiy, A. I.; Strizhevskiy, I. I.; Zhaylov, V. S.

TITLE: Explosion hazard of mixtures of oxides of nitrogen with fuel gases and vapors

SOURCE: Khimicheskaya promyshlennost', no. 4, 1965, 39-44

TOPIC TAGS: explosion, nitrogen oxide, fuel, ignition limit, flame propagation

ABSTRACT: The influence of pressure on the concentration limits of ignition for mixtures of oxides of nitrogen with fuel gases and vapors was determined. The present paper is an extension of the work reported previously by B. B. Brandt, L. A. Matov, A. I. Rozlovskiy, and V. S. Khaylov (Khim. prom. No. 5, 412, 1960) and B. B. Brandt, A. I. Rozlovskiy, and V. S. Khaylov (Khim. prom. No. 4, 204, 1961). Three series of experiments were carried out. In the first series, concentration ignition limits for mixtures of nitric and nitrous oxide with cyclohexane at a constant pressure of 8 atm were determined. In the second, the dependence of the critical concentration of nitrogen on the fuel-gas pressure at the lower ignition limit for the mixture of n-butane, nitric and nitrous oxides

Card 1/3

L 55016-65

ACCESSION NR: AP5010550

and nitrogen was determined. In the third, the pressure dependence of the upper ignition limit for the mixtures of methane, nitric and nitrous oxides and nitrogen was determined. The experimental procedure was that of V. S. Medvedeva, A. I. Rozlovskiy, and I. S. Royzen (Khim. prom. No. 4, 330, 1960). The self-ignition temperature of NO + NO_2 and $C_6H_{12}+N_2$ was found to be 780-800C. In the presence of air the self-ignition temperature was found to be 500C. Flame propagation velocities for the first and second series of experiments were determined. The data of the second series could be represented as $U_n \sim e^{-A/RT_b}$; where U_n is the flame propagation velocity and T_b the thermodynamic flame temperature. The constant A = 350 kcal/mole. The conditions for flame extinction for the system C_4H_{10} + NO + N_2O + N_2 at $\alpha = 1$, $\beta = 0.715$, I = 40%, Un = 10 cm/sec and 1 atm were determined. Raschig rings had a diameter of 14, 10, and 6 mm. α is the coefficient of excess oxidizing agent, I the overall content of inert components, and β is the fraction of nitric oxide in the mixture. To eliminate explosion hazards for systems containing equilibrium amounts of liquid hydrocarbons, the vapor-gas mixture must be diluted at the entrance to the cooling chamber with nitrogen or waste gases, or the throttling and cooling processes must be adjusted such that the mixture remains nonexplosive. For systems containing

Card 2/3

L 55016-65
ACCESSION NR: AP5010550

nonequilibrium amounts of liquid hydrocarbons, explosion hazard may be eliminated by controlling the initial composition of the mixture, by increasing its water vapor content, and by controlling its temperature. Calculations based on the data of D. H. Derbyshire (Symp. Chem. Process Hazards, London, 1960, p. 37) showed that for the oxidation of xylene at an overall pressure of 20 atm and 50 atm the mixture remains nonexplosive for 200-180C and 250-230C respectively. Orig. art. has: 2 tables, 9 graphs, and 2 equations.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: WA, GC

NO REF SOV: 013 OTHER: 010

Card 3/3

ROZLOVSKIY, A. I.; BORISOVA, I. Yu.

Explosionproof system for liquid-phase oxidation of toluol by atmospheric oxygen. Khim prom no. 3:199-201 Mr '64.
(MIRA 17:5)

KIL'MAN, Ya.I.; ROZLOVSKIY, A.I.

For more rapid introduction of the achievements of science and technology into the national economy. Zhur. VKHO 8 no.3: 349-351 '63. (MIRA 16:8)

ROZLOVSKIY, A.I.; BRANDT, B.B.

Maximum explosion-proof concentration of oxygen in mixtures with fuel gases. Khim.prom. no.7:518-519 Jl '63. (MIRA 16:11)

ZAKAZNOV, V.F. (Moskva); ROZLOVSKIY, A.I. (Moskva); STRIZHEVSKIY, I.I. (Moskva)

Limits for the extinction of deflagration flame by means of granulated and porous materials. Inzh. zhur. 3 no.2:280-287 '63. (MIRA 16:6)

(Fire extinction)

ROZLOVSKIY, A. I.; STRIZHEVSKIY, I. I.; ZAKAZNOV, V. F.

Safe high pressure gas mixer for highly explosive gas mixtures.
Zhur. fiz. khim. 36 no.12:2809-2810 D '62. (MIRA 16:1)

1. Gosudarstvennyy institut azotnoy promyshlennosti.

(Gases) (Mixing machinery—Safety appliances)

ROZLOVSKIY, A.I.

Prevention of the formation of explosive gas-vapor mixtures in technological processes. Zhur. VKHO 7 no.6:651-661 '62. (MIRA 15:12)
(Gases)
(Combustion, Spontaneous)

ROZLOVSKIY, A.I.; BRANDT, B.B.

Unified law governing the lower concentration limit of flame propagation. Dokl.AN SSSR 145 no.6:1331-1334 Ag '62.
(MIRA 15:8)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut azotnoy promyshlennosti i produktov organicheskogo sinteza. Predstavleno akademikom Ya.B.Zel'dovichem.
(Flame)

43474

S/076/62/036/012/014/014
B101/B180

AUTHORS: Rozlovskiy, A. I., Strizhevskiy, I. I., and Zakaznov, V. F. (Moscow)

TITLE: Safe high-pressure mixer for highly explosive gas mixtures

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 12, 1962, 2809 - 2910

TEXT: A high-pressure gas mixer (Fig.) consisting of a thick-walled 3-liter steel vessel calculated for a static pressure of 800 atm with a safety coefficient of 2, is suggested for experiments with highly explosive gas mixtures up to a pressure of 70 - 80 atm. All parts are made of metal, to avoid spontaneous ignition due to electrostatic charges. To avoid formation of acetylenides, no copper or bronze is used. Three models have been found suitable for the examination of gas combustion processes. It is recommended for laboratories. There is 1 figure.

ASSOCIATION: Gosudarstvennyy institut azotnoy promyshlennosti (State Institute of the Nitrogen Industry)

Card 1/2

Safe high-pressure mixer

S/076/62/036/012/014/014
B101/B180

SUBMITTED: April 2, 1962

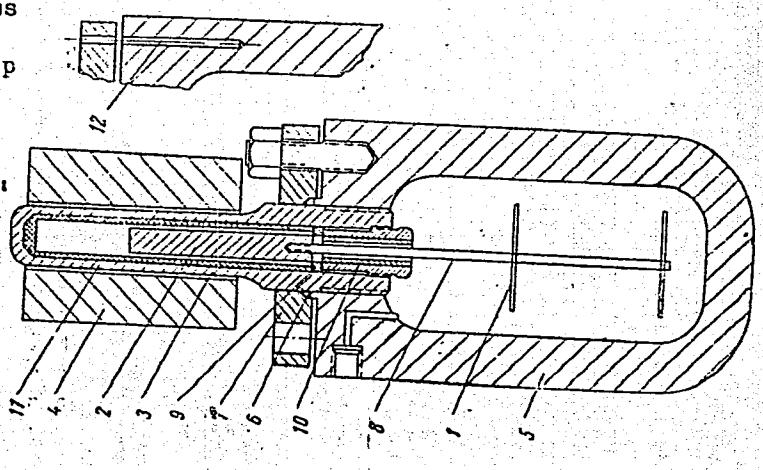


Fig. Mixing vessel. Legend: (1) Stirrer arms made of aluminum foil; (2) stirrer core; (3) top of the vessel, made of nonmagnetic 1Kh18N9T (1Kh18N9T) steel; (4) solenoid for driving (2); (5) steel vessel; (6) aluminum packing; (7) flange; (8) Duraluminum shaft of stirrer; (9) bushing; (10) Duraluminum bushing of stirrer; (11) lead liner; (12) thermocouple.

Card 2/2

ROZLOVSKIY, A.I.

Formation of nitric oxide in the decomposition flame of nitrous oxide. Kin.i kat. 2 no.6:809-815 N-D '61. (MIRA 14:12)

1. Gosudarstvennyy institut azotnoy promyshlennosti.
(Nitrogen oxide) (Combustion)

ROZLOZNIK, J.

TAKAC, M.

Czechoslovakia

Internal/Medicine/Clinic, Medical Faculty, Safarik University (Z internej kliniky Lek. fak. Safarikovej Univerzity v Kosiciach), Kosice; Director: F. POR, MD.

Brno, Vnitrni lekarstvi, No 10, Oct 62, pp 1105-1109.

"Ballistocardiogram in Complete Atrioventricular Block."

Co-authors:

MAJERNIK, J., MD, Director, Deprtment of Internal Medicine ~~OUNZ (Z~~ Interneho oddelenia OUNZ Humenne); ROZLOZNIK, J., Department of Internal Medicine OUNZ Humenne.

POR, F.; TAKAC, M.; GOMBOS, B.; ROZLOZNIK, J.; BENICKY, L.; TAKOCOVA, M.

Ventilation and hemodynamic indices in acute and chronic silicosis. Bratisl. lek. listy 43 no.4:219-225 '63.

1. Interna klinika Lek. fak. Univ. P.J. Safarika v Kosiciach, veduci prof. MUDr. F. Por, a oddelenie pre choroby z povolania pri Internej klinike Lek. fak. Univ. P.J. Safarika, veduci-ordinar MUDr. B. Gombos.

(SILICOSIS) (RESPIRATORY FUNCTION TESTS)
(THORACIC RADIOGRAPHY) (PULMONARY CIRCULATION)
(ELECTROCARDIOGRAPHY) (BALLISTOCARDIOGRAPHY)

ROZLOZNIK, J

SURNAME, Given Names

(4)

Country: Czechoslovakia

Academic Degrees: /not given/

Affiliation: (Interna klinika Lekarske fakulty Safarikovej Univerzity), Kosice; Director: Docent F. POR, MD.

Source: Prague, Vnitrni Lekarstvi, Vol VII, No 6, June 61, pp 611-620.

Data: "Ballistocardiographic Studies of Old Myocardial Infarctions."

Authors: TAKAC, M.
ROZLOZNIK, J.
TUMOVA, M.
TAKACOVA, M.

GPO 981643

135

ROZLOZNIK, J

SURNAME, Given Names

5

Country: Czechoslovakia

Academic Degrees: /not given/

Affiliation: Internal Clinic of the Faculty of Medicine, Safarik University (Interna klinika Lekarske fakulty Safarikovej Univerzity), Kosice; Director: Docent F. POR, MD.

Source: Prague, Vnitrni Lekarstvi, Vol VII, No 6, June 61, pp 611-620.

Data: "Ballistocardiographic Studies of Old Myocardial Infarctions."

Authors: TAKAC, M.
ROZLOZNIK, J.
TUMOVA, M.
TAKACOVA, M.

GPO 981643

139

ROZLOZNIK, L.

Some problems concerning the density of surveying operations. p. 211.

(Rudy. Vol. 5, no. 6, June 1957. Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 10, October 1957. Uncl.

ROZLOZNIK, L.

GEOGRAPHY & GEOLOGY

Vol. 63, no. 3, 1958

Rozloznik, L. Geologic conditions and ore deposits in the environs of Dobsina . p. 100.

Monthly Index of East European Accessions (EEAI) LC, Vol. 8, No. 1, Jan. 1958

ROZLOZNIK, L.

"Geology of the Georgi deposit near Dobsina."

p. 80 (Geologicky Sbornik, Vol. 9, no. 1, 1958, Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, no. 9, September 1958

ROZLOZNIK, L.

Use of statistical correlative analysis for calcuating reserves of ore, p. 7, RUDY (Ministerstvo hutniho prumyslu a rudnych dolu) Praha, Vol. 3, No. 1, Jan. 1955

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 4, No. 12, December 1955

ROZLOZNIK, Ladislav, doc. inz.; SALAT, Jan, prof. dr.

Stratigraphic and tectonic position of banatites on Stiavnicky ostrov. Sbor VST Kosice no. 2:103-110 '63.

1. Chair of Geology and Mineralogy, Higher School of Technology, Kosice (for Rozloznik). 2. Research Laboratory of Mineral Raw Materials of the Faculty of Mining, Higher School of Technology, Kosice (for Salat).

ROZLOZNIK, V.

"In the Singliar Cave."

p. 94 (Krasy Slovenska, Vol. 34, No. 3, Mar. 1957, Bratislava, Czechoslavakia)

GEOGRAPHY & GEOLOGY Periodicals

Monthly Index of East Euro ean Accessions (EEAI) LC. Vol. 7, No. 11, Nov. 1958

BRLOŽNÍK, V.

In a rubber boat under the Plesivec plain. p. 70. KRASY SLOVENSKA. (Poverencitvo dopravy. Riaditelstvo pre cestovny ruch) Bratislava. No. 2, Feb. 1955.

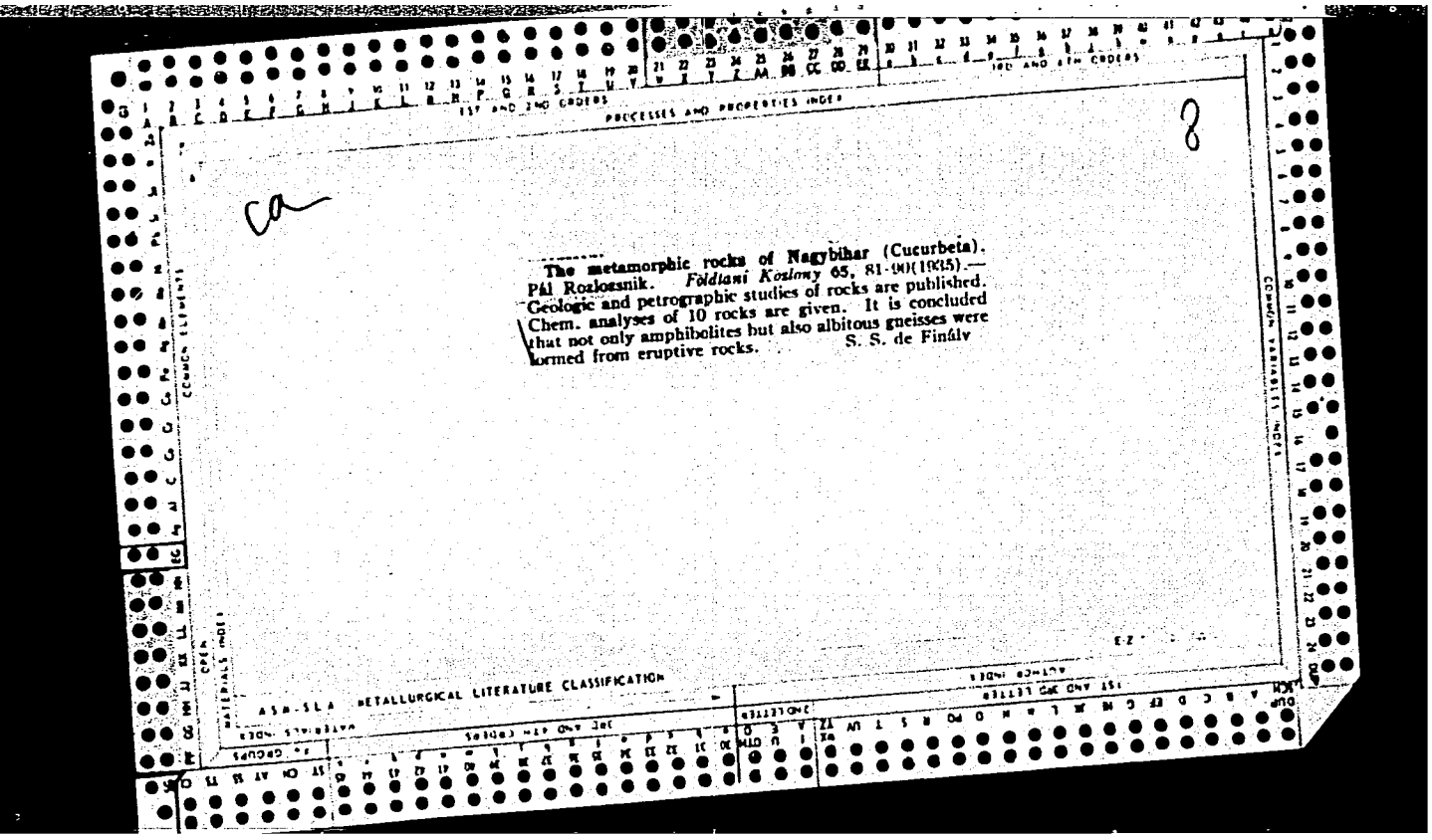
SOURCE: East European Accessions List, Vol. 5, no. 9, September 1956

ROZLOZNIK, V.

ROSLOZNIK, V. Precipices of the Plesivec Plateau. p.178.

Vol. 7, no. 3/4, 1955, GEOGRAFICKY CASOPIC, BRATISLAVA, CZECHOSLOVAKIA.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol.5, No. 10, Oct. 1956.



The metamorphic rocks of Nagybihar (Cucurbeia). Pál Rozlozsnik. *Földtani Kozlony* 65, 81-90(1935).—Geologic and petrographic studies of rocks are published. Chem. analyses of 10 rocks are given. It is concluded that not only amphibolites but also albitous gneisses were formed from eruptive rocks. S. S. de Finály

ROZMAINSKAYA, Z.N.

Frequency and characteristics of pulmonary hemorrhages in tuberculosis patients not treated and treated with antibacterial preparations. Sov.med. 26 no.1:79-84 Ja '63. (MIRA 16:4)

1. Iz kafedry tuberkuleza (zav. - prof. I.Ye.Kochnova) II Moskovskogo meditsinskogo instituta imeni N.I.Pirogova.
(TUBERCULOSIS) (HEMORRHAGE)

KOCHNOVA, I.Ye., prof.; MIKHAYLOVA, G.N.; TEREKHOVA, V.R.; ROZMAINSKAYA, Z.N.; MALOVA, M.V.; KISLYAKOVA, N.V.

Tuberculosis vaccination in adult subjects with a positive tuberculin reaction. Sov.med. 23 no.12:58-63 D '59. (MIRA 13:4)

1. Iz kafedry tuberkuleza (zaveduyushchiy - prof. I.Ye. Kochnova) II Moskovskogo meditsinskogo instituta imeni N.I. Pirogova.
(BCG VACCINATION)

J-5

USSR/Soil Science - Cultivation, Melioration. Erosion.

Abs Jour : Ref Zhur - Biol., No 9, 1958, 39054.

Author : Rozmakhov, I.G.

Inst : Leningrad Silvicultural Academy.

Title : Erosion-Landslide Phenomena Caused by Deforestation.

Orig Pub : Tr. Leningr. lesotekhn. akad., 1957, vyp. 81, ch. 3, 87-89.

Abstract : The results of the author's observations in the rivers Zelenchuk, Beloy, Maloy and in the Bol'shoy Laba basins are given in this sutdy.
Intensive cattle grazing and the destruction of wood and undergrowth on the slopes, provoke an intensive erosion of the fine earth leading to a total removal of the soil layer. It is recommended to limit the felling of trees in the basins of these rivers.

Card 1/1

ROZMAKHOV, I.G.

Methodology of forest soil field research. Trudy Len. lessotekh. akad. no.82 pt.2:69-73 '57. (MIRA 11:9)
(Forest soils)

ROZMAN, B.S.

Early hospital treatment of acute disorders of the brain's blood supply in the neurological department of a city hospital. Zhur. nevr. i psikh. 62 no.2:257-258 '62. (MIRA 15:6)

1. Bol'nitsa Dzerzhinskogo rayona (glavnyy vrach A.A. Galkina, nauchnyy rukovoditel' - doktor meditsinskikh nauk G.Z. Levin), Leningrad.

(CEREBROVASCULAR DISEASE)

ROZMAN, B.Yu.; SIVOLODSKIY, Ye.A.; DAVYDOV, Yu.A.; BYSTROV, A.N.

Thermal decomposition of ammonium nitrate. Zhur. prikl. khim. 31 no.7:1101-1102 Jl '58. (MIRA 11:9)
(Ammonium nitrate)

AUTHORS: Rozman, B.Yu., Borodkina, L.I. SOV/80-32-2-7/56

TITLE: Inhibition of the Thermal Decomposition of Ammonium Nitrate (Ingibirovaniye termicheskogo razlozheniya ammiachnoy selitry)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 2, pp 280-284 (USSR)

ABSTRACT: The inhibiting effect of urea on the thermal decomposition of ammonium nitrate has been investigated by thermogravimetric and manometric methods. The content of urea in the samples varied from 0.01 - 1%. The inhibiting effect decreases with time due to the decomposition of urea. The inhibiting effect of urea is explained by the production of ammonia due to thermal decomposition of urea. Ammonia neutralizes nitrogen dioxide which decomposes ammonium nitrate as a catalyst. Nitrogen dioxide may also directly react with urea forming nitrogen and carbon dioxide. Urea itself decomposes at 130°C, i.e. at a lower temperature than ammonium nitrate. Its inhibiting effect when dissolved in ammonium nitrate is therefore unexpected. This effect is only present if there is a large excess of ammonium nitrate. The increase of urea above 1% is not recommended therefore.
There are 3 graphs, 2 tables, and 3 references, 2 of which are Soviet and 1 English.

Card 1/2

Submitted: May 1958

ROZMAN, B.Yu.

Mechanism of the thermal decomposition of ammonium nitrate. Zhur. prikl.khim. 33 no.5:1052-1059 My '60. (MIRA 13:7)
(Ammonium nitrate)

ROZMAN, B.Yu.

Effective selection of inhibitors for the thermal decomposition of ammonium nitrate. Zhur. prikl. khim. 33 no.6:1258-1263 Je '60. (MIRA 13:8)

(Ammonium nitrate) (Inhibition (Chemistry))

21334
S/078/61/006/004/005/018
B121/B216

5.2400 2209 1043 1273

AUTHOR: Rozman, B. Yu.

TITLE: Thermal decomposition of ammonium nitrate in the presence of chlorides

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 4, 1961, 783-785

TEXT: The mechanism of thermal decomposition of ammonium nitrate in the presence of ammonium chloride was investigated. Ammonium nitrate, ammonium chloride, and a mixture of ammonium nitrate with 1% ammonium chloride were heated at a temperature of 200°C. Samples were taken at intervals, dissolved in water, and the resulting pH measured. Addition of 1% ammonium chloride was found to produce a considerable decrease of pH. The decomposition of ammonium nitrate in the presence of ammonium chloride is an autocatalytic process, the rate of decomposition depending on the concentration of NO_2 formed during the thermal decomposition of nitric acid. An increase in the concentration of the active centers in a mixture of ammonium nitrate and ammonium chloride may also be attained by the addition of nitric acid. The acceleration of ammonium nitrate decomposition

Card 1/3

Thermal decomposition of ...

on addition of ammonium chloride, a phenomenon observed by H. Tramm and H. Welde (Ref. 4: Z. anorg. Chem., 47, 782, 1934), is explained by the occurrence of free nitric acid in the ammonium nitrate. The following mechanism is suggested:

a) $NH_4Cl \rightleftarrows NH_3 + HCl$

b) $NH_3 + NO^+NO_3^- \longrightarrow NH_2NO + H^+ + NO_3^-$

c) $NH_2NO \longrightarrow N_2 + H_2O$

d) $NO^+NO_3^- + Cl^- \longrightarrow NO + NO_3^- + Cl$

$NH_4Cl + 2N_2O_4 \longrightarrow 2HNO_3 + N_2 + NO + Cl + H_2O$

The formation of N_2O may be explained by the following radical mechanism:

Thermal decomposition of ...

a) $NH_3 + NO_2 \longrightarrow NH_2^+ + HNO_2$

b) $NH_2^+ + NO_2 \longrightarrow NH_2NO_2 \longrightarrow N_2O + H_2O$

c) $2HNO_2 \longrightarrow NO + NO_2 + H_2O$

$2NH_3 + 3NO_2 \longrightarrow 2N_2O + NO + 3H_2O$, which is probably accompanied by a side reaction: $NO + NH_2^+ \longrightarrow NH_2NO \longrightarrow N_2 + H_2O$. Chlorine also acts as an activator or as an oxidizing agent for ammonia: $3Cl_2 + 2NH_3 \longrightarrow N_2 + 6HCl$. There are 1 figure and 17 references: 4 Soviet-bloc and 13 non-Soviet-bloc.

SUBMITTED: March 18, 1960

Card 3/3

L 04828-67 EWT(1) IJP(c) SOURCE CODE: UR/0051/66/021/002/0178/0180

ACC NR: AP6026969

40
13

AUTHOR: Izmaylov, S. V.; Rozman, G. A.

ORG: none

TITLE: Formation of an H'-center

SOURCE: Optika i spektroskopiya, v. 21, no. 2, 1966, 178-180

TOPIC TAGS: crystal lattice vacancy, crystal lattice defect, color center, electron trapping

ABSTRACT: Calculations performed in the paper show that there is a definite probability of formation of a new center which is a complex defect called the H'-center and consists of the neutral pair vacancy+electron. The H'-center should be less stable than F- and F'-centers. Therefore, the H'-center should dissociate as a result of thermal fluctuation or light absorption. As in the crystal with F'-centers, an appreciable photoconductivity due to the dissociation of H'-centers should exist down to the lowest temperatures. The H'-center should be anisotropic, and data on it can be obtained by studying polarized luminescence. It is known that when a colored alkali halide crystal is illuminated with light corresponding to the F-band (or white light) at room temperature, its decolorization takes place, and new bands appear in place of the F-band. In the authors' view, H'-centers may be responsible for the appearance

UDC: 548.0:620.192

Card 1/2

L 04828-67
ACC NR: AP6026969

of one of these bands. Orig. art. has: 18 formulas.

SUB CODE: 20/ SUBM DATE: 23Apr65/ ORIG REF: 005/ OTH REF: 004

Card 2/2 gd

L 9647-66 EWT(l)/EWT(m)/T/EWP(t)/EWP(b)/EWA(m)-2 IJP(c) JD/JG/GG/AT

ACC NR: AP5025379 SOURCE CODE: UR/0181/65/007/010/3008/3014

AUTHOR: Izmaylov, S. V.; Rozman, G. A.

ORG: Leningrad State Pedagogical Institute im. A. I. Gertsen (Leningradskiy gosudarstvennyy pedagogicheskiy institut)

TITLE: Elastic scattering of excitons and electrons by neutral pair vacancies in alkali halide crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3008-3014

TOPIC TAGS: alkali halide, electron scattering, crystal theory, crystal lattice defect, crystal lattice vacancy

ABSTRACT: The paper is a theoretical study of elastic scattering of relatively fast secondary electrons and non-polarized excitons by dipolons. Dipolons are defined as pair defects of three types: two oppositely charged vacancies at adjacent lattice sites; two oppositely charged interstitial ions separated by a distance of the order of a lattice constant; or a vacancy and a nearby oppositely charged interstitial ion. To make the problem specific, the case of two adjacent oppositely charged vacancies is considered. The results are true for the second case, and with some simplification for the third case also. Exciton and electron scattering are considered separately. Numerical calculations are made for scattering in NaCl and KCl crystals. Mean

Card 1/2

L 9647-66

ACC NR: AP5025379

free paths are calculated and temperatures are determined below which dipolon-exciton scattering predominates over scattering by thermal lattice vibrations. The mean free path for KCl is $\approx 4 \cdot 10^{-4}$ cm, and the critical temperature for predominate dipolon scattering is $\approx 10°K$. The corresponding values for sodium chloride are $\approx 5.5 \cdot 10^{-4}$ cm and very nearly 9°K. Formulas are derived for determining residual resistance due to electron-dipolon scattering. It is shown that perturbation theory may be used for the interaction potential. Orig. art. has: 1 figure, 41 formulas.

SUB CODE: 20/ SUBM DATE: 08Jul64/ ORIG REF: 012/ OTH REF: 006

Card 2/2

L 3351-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) GG/JD/JG

ACCESSION NR: AP5017279 UR/0181/65/007/007/1921/1925

AUTHOR: Rozman, G. A. 44,55

TITLE: Concerning the occurrence of an alpha band in the absorption spectrum of alkali-halide crystals 21,44,55

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 1921-1925

TOPIC TAGS: exciton, alkali-halide, crystal defect, crystal lattice vacancy, absorption spectrum, absorption band

ABSTRACT: The article deals with the role of the dipolons (complex defects consisting of a halide vacancy plus an alkaline-metal vacancy, produced in neighboring lattice points) in the formation of excitons. Expressions are derived for the difference in the energy of formation of free exciton and of the exciton near the dipolon in two possible cases, one when the dipolon and the exciton are parallel, and the other when the dipolon and the exciton are on the same line. The calculations for the exciton production, based on the model of Mott (N. F. Mott and R. W. Gurney, Electronic Processes in Ionic Crystals,

Card 1/2

L 3351-66
ACCESSION NR: AP5017279

Oxford, 1940) and A. Hippel (Zs.f.Phys. v. 101, 680, 1936) are considered and compared with experimental data on NaCl, KCl, KBr, and KI. From a comparison of the experimentally observed differences in the energy corresponding to the first peak of the exciton absorption in the α band, and the calculated values, it is seen that the formation of the exciton is more probable near the dipolon when the dipolon and exciton are on the same line, than in all other cases. Methods of experimentally observing the formation of excitons near dipolons are indicated. 'The author thanks S. V. Izmailov for guidance.'
Orig. art. has: 4 figures, 7 formulas, and 1 table.

ASSOCIATION: Leningradskiy gosudarstvennyy pedagogicheskiy institut im. A. I. Gertsena (Leningrad State Pedagogical Institute)

SUBMITTED: 08Jul64 ENCL: SUB CODE: OP, SS

NR REF SOV: 001 OTHER: 006

Card 2/2

ROZMAN, I.M.

USSR/ Laboratory Equipment. Apparatuses, Their Theory, Construction and Application. I

Abs Jour: Referat. Zhur.-Khimiya, No. 8, 1957, 27350.

Author : I. M. Rozman, K.G. Tsimmer.

Title : [redacted] Application of Scintillators to Dosimetry.

Orig Pub: Vestn. rentgenol. i radiologii, 1955, No. 1, 63 - 69.

Abstract: Review. Bibliography with 45 titles.

Card 1/1

USSR/Physics - Luminescence

ROZMAN, I.M.

Card 1/1 Pub 146-22/25

Author : Rozman, I. M.

Title : Luminescence yield of organic scintillators

Periodical : Zhur. eksp. i teor. fiz. 28, 251-252, February 1955

Abstract : The author presents the results of an investigation into the temperature dependence of luminescence output of plastic scintillators made by the polymerization of 1.5% solution of 1, 1, 4, 4-tetraphenyl 1, 3 butadiene in purified styrol (polymerization without catalyzer and plasticizer at high temperature and high pressure). The scintillator was excited either by gamma rays of cobalt 60 or by alpha particles of polonium; intensity of illumination was measured by the mean current of the photoelectric amplifier FEU-19. He presents graphs of intensity versus temperature for various types of excitation; quenching of prolonged illumination; and thermoluminescence versus time. Six references, two USSR; V. A. Levshin, Fotolyuminestsentsiya zhidkikh i tverdykh veshchestv, 1951; V. A. Yastrebov, ZhETF, 21, 164, 1951 and DAN SSR, 90, 1015, 1953.

Institution: -

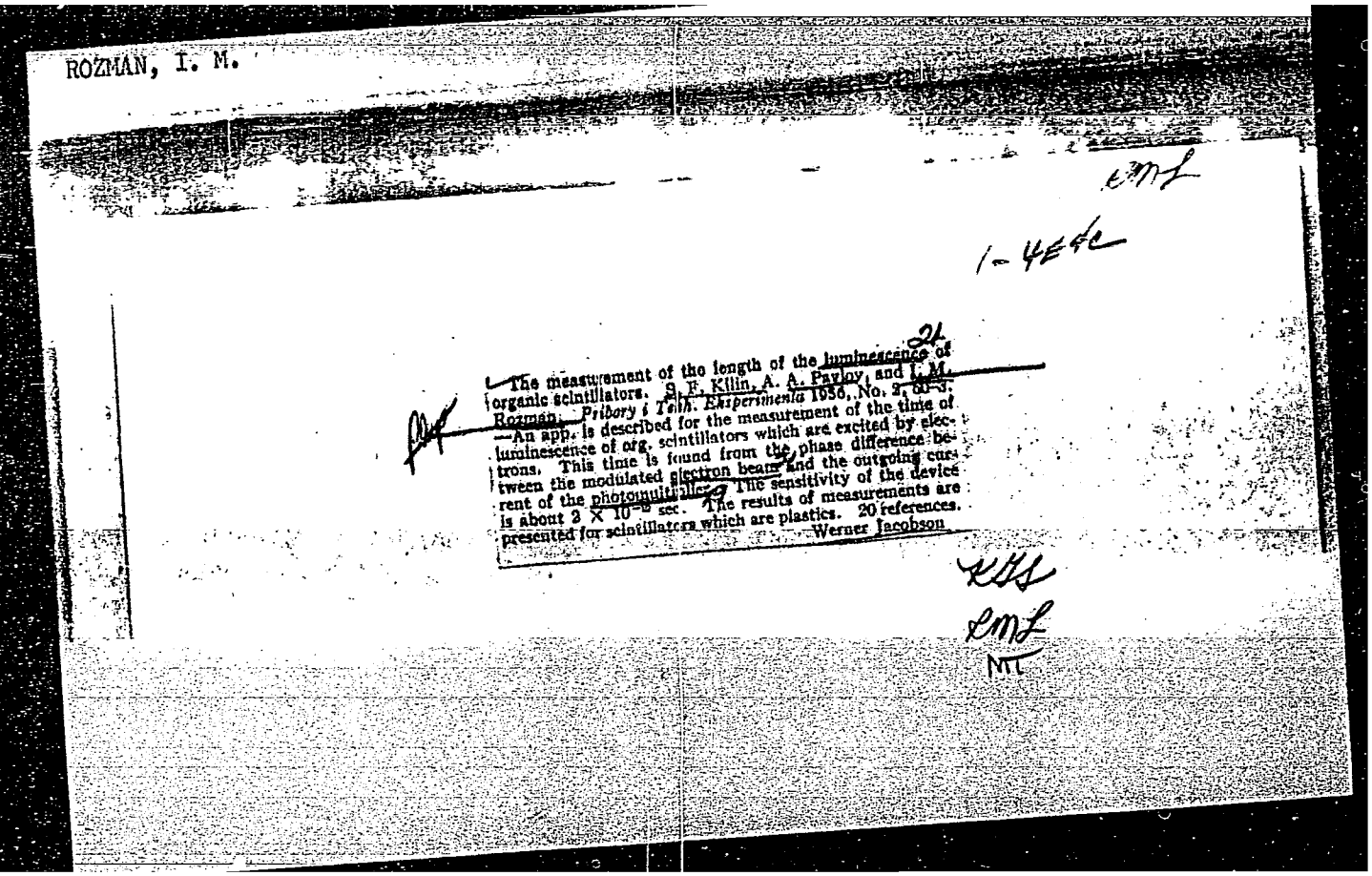
Submitted : September 8, 1954

ROZMAN, I.M.

ANDREYESHCHEV, Ye.A.; BARONI, Ye.Ye.; KHVYRZINA, K.A.; PANI, I.E.; ROZMAN, I.M.; SHONIYA, V.M.

Plastic scintillators based on polystyrene. Prib. i tekh. eksp. no.1:32-34 Jl-Ag '56. (MLRA 10:2)

(Scintillation counters) (Styrene)



ROZMAN, I. M.

emf

1-46 dc

The measurement of the length of the luminescence of organic scintillators. S. F. Kilin, A. A. Pavlov, and I. M. Rozman. *Pribory i Tekh. Eksperimenta* 1956, No. 2, 60-3.

An app. is described for the measurement of the time of luminescence of org. scintillators which are excited by electrons. This time is found from the phase difference between the modulated electron beam and the outgoing current of the photomultiplier. The sensitivity of the device is about 2×10^{-9} sec. The results of measurements are presented for scintillators which are plastics. 20 references.

Werner Jacobson

KHS

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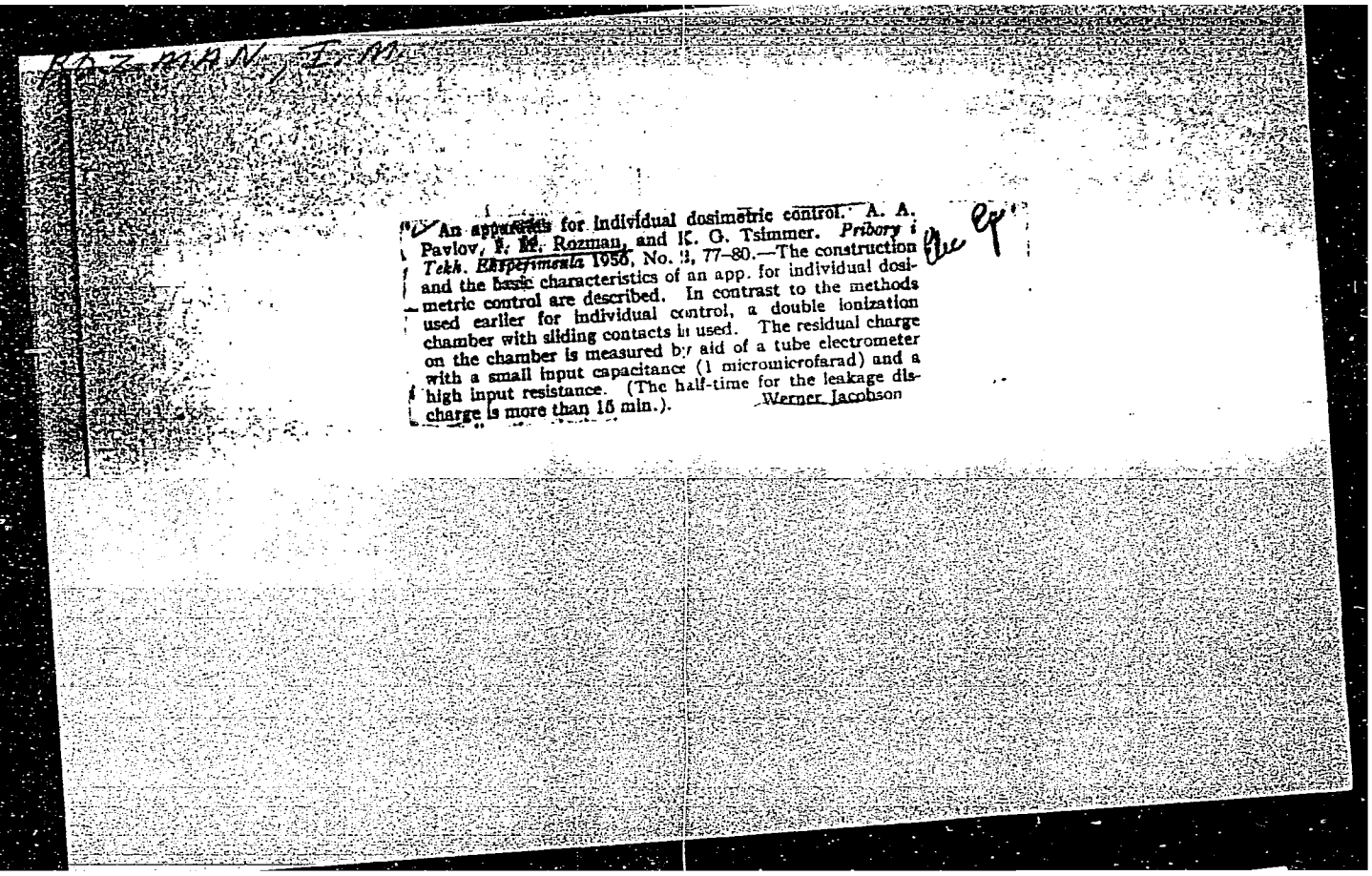


ROZMAN, I. M.

"An apparatus for individual dosimetric control." A. A. Pavlov, I. M. Rozman, and K. G. Tsimmer. *Pribory i Tekh. Eksperimenta* 1956, No. 3, 77–80.—The construction and the basic characteristics of an app. for individual dosimetric control are described. In contrast to the methods used earlier for individual control, a double ionization chamber with sliding contacts is used. The residual charge on the chamber is measured by aid of a tube electrometer with a small input capacitance (1 micromicrofarad) and a high input resistance. (The half-time for the leakage discharge is more than 15 min.). Werner Jacobson

G-2

ROZMAN, I. M.

USSR/Electricity - Dielectrics

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12083

Author : Rozman, I.M., Tsimmer, K.G.

Inst :

Title : Investigation of the Electric Conductivity of Insulating Materials Before, During and After Irradiation.

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 8, 1661-1688

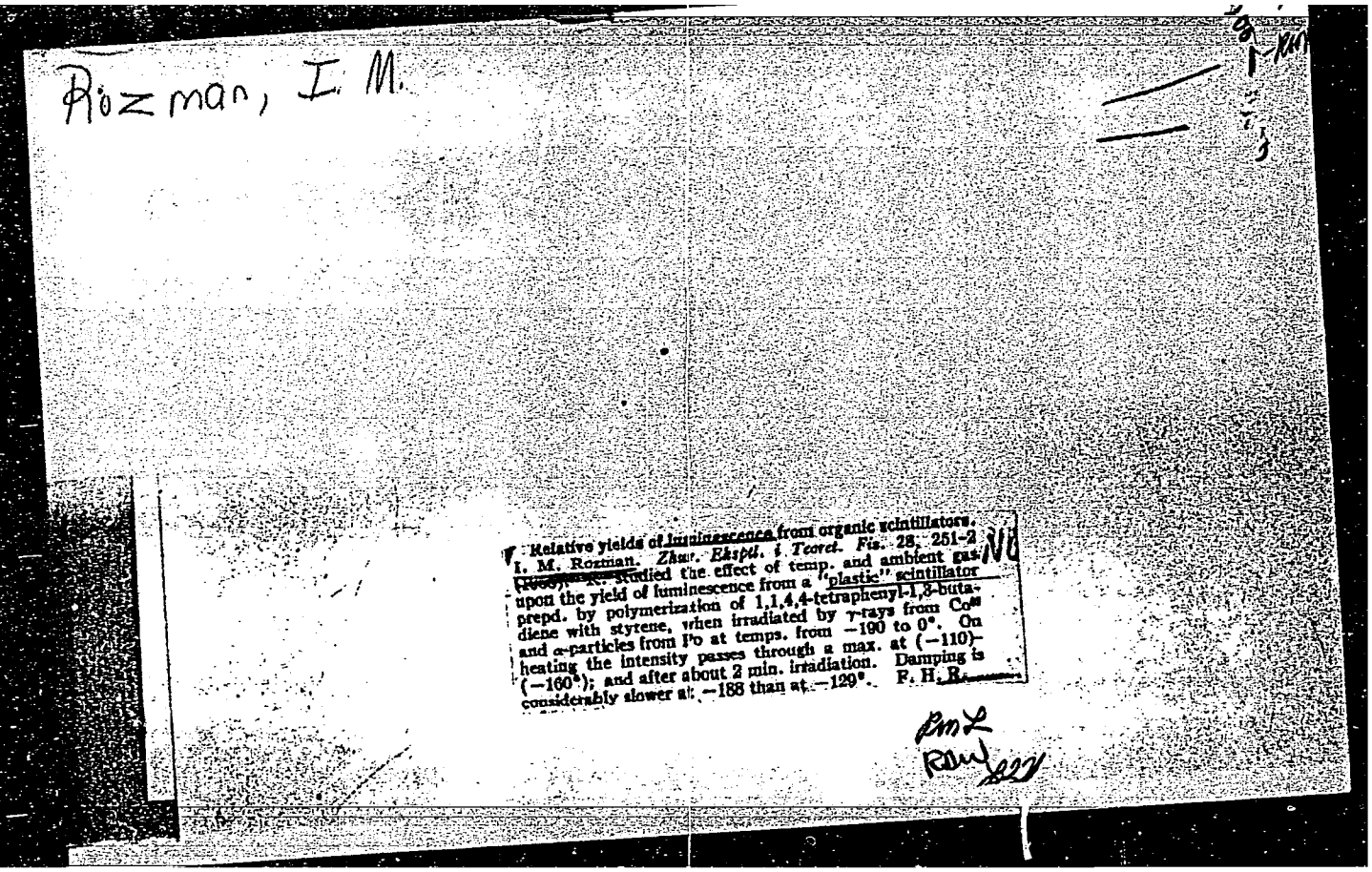
Abstract : Description of the application of capacitor ionization chambers for the measurement of the electric conductivity of insulating materials before, during, and after the action of ionizing radiation, and also for the measurement of the temperature dependence of the electric conductivity. A description is given of the construction of capacitor ionization chambers. An estimate is made of the change in the potential of the chamber under the influence of the ratiation. In order to test the method, measurements were made with pressed amber, polystyrol of

Card 1/2

Card 2/2

ROZMAN, I. M.

This electrical conductivity of insulating materials before, during, and after radiation. I. M. Rozman and K. G. Tshramer. *Zhur. Tekh. Fiz.* 20, 1631-8(1950).—A new method is described for simplified measurement of elec. cond. of insulating materials before, during, and after the effect of ionizing radiation. The detn. of the temp.-elec. cond. relation is also mentioned. By this method, measurements were made on compressed amber (I), polystyrene (II), poly(methyl methacrylate) (III), polyethylene (IV), and poly(chlorotrifluoroethylene) (V). Two types of condenser chambers used for the measurement of cond. in dielectrics and its changes, as effected by radiation, are described. The change of potential of the measuring electrode is given by the following equation for the type-1 chamber: $\Delta\varphi_e = -(2\pi\ n_0\epsilon/\epsilon)ae^{-\mu a}\mu_1 bt$, where ϵ is dielec. const. of the insulator, a thickness of the insulator, b thickness of the aquadag electrode, μ and μ_1 are absorption coeffs. of β-particles in the insulator and the aquadag, n_0 d. of the β-particle stream, and t time of radiation. For the type-2 chamber, the equation was simplified by eliminating μ_1 and b terms and multiplying the right-hand part by 2. Equal vols. of air possessed several times greater elec. cond. than did all above-mentioned substances. This was because of radiation. Vol. cond. was found to be the lowest for III, I, and V, as a result of radiation and of screening the insulating surface. Org. insulators possessed high temp. coeff. of cond., which increased upon radiation. 18 references. P. P.



Rozman, I. M.

Relative yields of luminescence from organic scintillators. I. M. Rozman. *Zhur. Eksptl. i Teoret. Fiz.* 28, 251-2 (1955). Studied the effect of temp. and ambient gas upon the yield of luminescence from a "plastic" scintillator prepd. by polymerization of 1,1,4,4-tetraphenyl-1,3-butadiene with styrene, when irradiated by γ-rays from Co^{60} and α-particles from Po^{210} at temps. from −190 to 0°. On heating the intensity passes through a max. at (−110)–(−160°); and after about 2 min. irradiation. Damping is considerably slower at −188 than at −129°. F. H. R.

ROZMAN, I. M., Cand Phys-Math Sci -- (diss) "Plastic Scintillators Based on Polysterol." [illegible], 1957. 18 pp, 100 copies. Bibliography: pp 16-18 (58 titles) (KL, 51-57, 91)

ROZMAN, I.M.

Call Nr: None given

AUTHOR: See Table of Contents

TITLE: Investigations in the Field of Ionizing Radiation Dosimetry. Collected Articles. (Issledovaniya v oblasti dozimetrii ioniziruyushchikh izlucheniy. Sbornik statey.)

PUB. DATA: Izdatel'stvo Akademii nauk SSSR, Moscow, 1957, 191 pp., 6000 copies.

ORIG.AGENCY: Akademiya nauk SSSR. Otdeleniye fizika-matematicheskikh nauk.

EDITOR: Aglintsev, K. K., Doctor of Technical Sciences; Ed. of the Publishing House: Kuznetsova, Ye.B., Tech.Ed.: Kiseleva, A. B.

Card 1/7

Investigation in the Field of Ionizing Radiation Dosimetry (Cont.)

PURPOSE: To present in a collected form research studies carried out in 1950-1954, part of which were submitted at the conference on dosimetry called in 1954 by the Academy of Sciences, USSR.

COVERAGE: The articles are devoted to investigation of beta-active substance absolute measurements, scintillation methods, individual control devices, dosimetry measurement techniques, and calculations relating to admissible level limits of exterior radiation fluxes. The articles deal with Russian contributions. For references see Table of Contents.

TABLE OF CONTENTS

There are 51 references, 11 of which are USSR, 34 English, and 4 French.

Card 2/7

Investigation in the Field of Ionizing Radiation Dosimetry (Cont.)

Keirim-Markus, I. B., L'vova, M. A. Method of Absolute Measurements of Beta-Radiation Activity Sources by Means of End-type Counters (Communication II). 38-71

There are 33 references, 7 of which are USSR, 23 English, 1 French, and 2 are translations into Russian.

Antonova, I. A. Method of Beta-Activity Absolute Measurement by Means of Small Ionization Chambers. 72-81

There are 10 references, 7 of which are USSR, and 3 English.

Rozman, I. M., Tsimmer, K. G. On the Use of Scintillators in Dosimetry. 82-89

There are 50 references, 2 of which are USSR, 41 English, and 7 German.

Card 3/7

Investigation in the Field of Ionizing Radiation Dosimetry (Cont.)

Card 4/7

Investigation in the Field of Ionizing Radiation Dosimetry (Cont.)

Ardenne, M., Yeger, G., Isayev, B., Roggenbruk, V., Froylikh, G. Pocket Gamma-radiation Dosimeter. 112-114

There are 2 references, both USSR.

Pavlov, A.A., Rozman, I.M., Tsimmer, K.G. A Device for Individual Dosimetric Control. 115-120

There are 10 references, 2 of which are USSR, 5 English, and 3 German.

Levochkin, F. K. Pocket Gamma-indicator. 121-131

There are 6 references, 5 of which are USSR, and 1 English.

Nikitin, N. S., Frolov, V.V. Improved Method of Individual Photographic Control (IFK-II) of Gamma-Ray Damage. 122-131

There are 6 references, 3 of which are USSR, 2 are translations into Russian, and 1 English.

Card 5/7

Investigation in the Field of Ionizing Radiation Dosimetry (Cont.)

Card 6/7

AVAILABLE: Library of Congress.

7/7

SUBJECT USSR / PHYSICS
AUTHOR ROZMAN,I.M., CIMMER,K.G.
TITLE The Damage Suffered by Plastic Scintillators as a Result of Ionizing Radiation.
PERIODICAL Atomnaja Energija, 2, fasc.1, 54-60 (1957)
Issued: 3 / 1957

By investigating the damage caused to scintillators made of plastic material it is possible to determine the character of the general processes taking place on the occasion of damage being caused to organic scintillators. Many details of these processes have as yet not been investigated.
Investigation method: In their laboratories the authors examined plastic scintillators made from polystirol with special luminescent additions, especially paraterphenyl (PT) and 1,1,4,4-tetraphenylbutadiene (TFB). Also such plastic scintillators as were made from pure polystirol were examined. Luminescence was investigated by means of a photoelectric multiplier (type FEU-19) with mirror galvanometer. The emission- and absorption spectra were measured by means of a photospectrometer with various connecting pieces produced by themselves. The same apparatus was used also as monochromator for the excitation of photoluminescence by a certain domain of the spectrum. The plastic materials were irradiated by α- and β-rays of Po^{210}- and Ce^{144}-Pr^{144}-preparations.
Conclusions: The yield of luminescence of scintillators made from plastic

Atomnaja Energija, 2, fasc.1,54-60 (1957) CARD 2 / 2 PA - 1956

material diminishes with an increase of the radiation dose received. A reduction of the yield occurs also (in a different measure) on the occasion of the excitation of luminescence by both ionizing and longwave ultraviolet radiation. In the case of equal absorbed radiation doses plastic scintillators suffer greater damage through α-irradiation than in the case of β-irradiation. Besides, the degree of the damage - if the same dose is absorbed - does not depend on dose efficiency (in the domain under investigation). Besides the yield of light also the transparence for the light of self-luminescence is diminished. However, this reduction provides no satisfactory explanation of the observed decrease of the intensity of the luminescence of plastic scintillators. The transparency curves and spectrometric measurments show that, on the occasion of the irradiation of plastic scintillators, substances are produced which absorb ultraviolet radiation (particularly within the range of the luminescence of pure polystirol) in a high degree. The entire course taken by the curves of the damage and of the dependence on the dose cannot be described by just any simple theorem. For the initial range of the decrease of the yield of the luminescence of pure polystirol it holds that $1/(1+kD)$, and in the case of plastic scintillators made from polystirol with TFB or PT+TFB a formula of the type $\exp(-kD)$ applies. A reduction of the yield of luminescence of plastic scintillators to the e-th part is caused by a dose of α-radiation of about 10^{10} erg/g.

INSTITUTION:

SUBJECT USSR / PHYSICS
AUTHOR ROZMAN,I.M., CIMMER,K.G.
TITLE On the Applicability of Scintillators made of Plastic Material for Dosimetric Measurements.
PERIODICAL Atomnaja Energija 2, fasc.1, 70-71 (1957)
Issued: 3 / 1957

Organic luminescent materials are well suited for various dosimetric measurements. The high radiation resistance of scintillators made from plastic material on the basis of polystirol make it possible to use these scintillators for measurements carried out under intense irradiation.
The authors carried out investigations for the purpose of solving the important problem of the possible saturation, i.e. the conservation of proportionality between the intensity of the luminescence of the plastic scintillators and the strength of the irradiation dose. In the course of these tests scintillators made from plastic material were excited by α- and β-particles.
Scintillators made from plastic material on the basis of polystirol with the addition of tetraphenylbutadience and of paraterphenyl with tetraphenylbutadiene were investigated. The intensity of the luminescence was determined from the average amperage of the photoelectronic multiplier FEU-19. The strength of the dose of the α-radiation (Po^{210}) and of the β-radiation ($Ce^{144} - Pr^{144}$) was determined by a method described by I.M.ROZMAN and K.G.CIMMER, Atomnaja Energija 2, No 1, 54 (1957). A graph illustrates the dependence of the intensity of the luminescence of the two aforementioned types of plastic counters

Atomnaja Energija 2,fasc.1, 70-71 (1957) CARD 2 / 2 PA - 1958

upon the strength of β-radiation. It may easily be seen that in the domain under investigation (up to 10^5 erg/g sec) there is direct proportionality between these quantities. Also for α-radiation a lack of saturation (largest dose output ~ 16^6 erg/g sec) was found to exist. Corresponding data are given in form of a table.

It was thus shown that the yield of the luminescence of plastic scintillators, at least up to an amount of 10^6 erg/g sec or 10^4 r Aeq/sec(?), is proportional to the dose of ionizing radiation. Furthermore, it follows from the results obtained by investigating the damage suffered by plastic scintillators as a result of ionizing radiation, that, in the case of an accuracy of dosimetric measurements of the order of 10% the damaging effects (diminished yield and additional absorption of self-luminescence) may be disregarded up to the total dose of 3.10^6 r-Aeq.

INSTITUTION:

51-4-12/25

AUTHOR: Rozman, I.M.

TITLE: Temperature dependence of the luminescent yield of plastic scintillators with triphenylpyrazoline. (Zavisimost' vykhoda lyuminestsentsii plastmassovykh stsintillyatorov s trifenilpirazolinom ot temperatury.)

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy) 1957, Vol.2, No.4, pp.480-487 (U.S.S.R.)

ABSTRACT: To test J.B.Birks' theory of multistep mechanism of radioluminescence ("Scintillation counters", translated into Russian, Moscow, 1955; Phys.Rev., Vol.94, 1567, 1954) the temperature dependence of the scintillation yield of polystyrene - pure and with 1, 3, 5-triphenylpyrazoline-Δ^2 (TPP) was studied. Preparation of the scintillators was described earlier (E.A.Andreeshchev et al., Pribory i tekhnika eksperimenta, Vol.1, 32, 1956). Photomultiplier current was measured for excitation with α, β (from Ce—Pr^{144}) and γ-rays (from Co^{60}) and with Hg lines 2537, 3650-3663 Å. Samples of pure polystyrene and with 0.01, 0.1 and 1% of TPP (16 mm in diameter and 10 or 0.5 mm thick) were studied at temperatures from 100 to 350° K. A polystyrene light-channel was interposed between the scintillator and the photomultiplier, and all surfaces in optical contact were well polished. Results are presented in graphs and tables. On excitation with α, β, γ-rays

Card 1/2

51-4-12/25

Temperature dependence of the luminescent yield of plastic scintillators with triphenylpyrazoline. (Cont.)

and with 2537 Å the temperature dependence of the photomultiplier current becomes flatter as the concentration of TPP increases. Direct excitation of the TPP molecules by 3650-3663 Å produces scintillation independent of temperature. In general the current measured decreases with temperature, especially at the upper end of the temperature interval studied. Experiments on thick and thin samples (10 mm and 0.5 mm) show that there is a considerable self-absorption in polystyrene. The quantum yield of pure polystyrene for all excitations decreases from 0.20 at 130°K to 0.07 at 330°K. Luminescence spectra of polystyrene with TPP show no polystyrene emission. This means that incident energy is transferred from polystyrene to TPP. This transfer process occurs in two ways: (a) photon transfer which dominates at low (0.01%) TPP concentrations, and (b) radiationless transfer which dominates from 0.1% of TPP onwards. There are 7 figures, 3 tables and 9 references, 5 of which are Slavic.

SUBMITTED August 30, 1956.
AVAILABLE: Library of Congress

Card 2/2

ROZMAN, I.M.

AUTHORS: Andreyeshchev, Ye.A. and Rozman, I.M. 51-4-13/25

TITLE: Luminescence spectra of plastic scintillators with triphenyl-pyrazoline. (Spektry lyuminestsentsii plastmassovykh stsintillyatorov s trifenilpirazolinom.)

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy) 1957, Vol.2, No.4, pp.488-493 (U.S.S.R.)

ABSTRACT: This paper is directly related to the work described in the preceding abstract. Plastic scintillators prepared by polymerization of a solution of 1, 3, 5-triphenylpyrazoline-Δ^2 (TPP) in styrene were studied. Samples were of 16 mm diameter and 10 or 0.5 mm thick. They were well polished to ensure good optical contact. Details of the preparation of the samples are given in Ye.A.Andreeshchev et al., Pribory i Tekhnika Eksperimenta, Vol.1, 32, 1956. Luminescence spectra were measured with a quartz monochromator and a photomultiplier. The samples were excited with β-rays from $Ce\text{--}Pr^{144}$ of 150 millicurie activity, and with mercury lines 2537 and 3650-3663 Å (U.V.) separated out with another quartz monochromator. Quantum sensitivity v. wavelength was found for the photomultiplier and the whole of the apparatus by subsidiary experiments. The spectra were measured for 0.01, 0.1 and 1% weight/weight concentrations of TPP in polystyrene. For 10 mm thick samples the spectra are the same both for β-ray and u.v. excitation. They are peaked at 400-450 mμ.

Card 1/2

51-4-13/25

Luminescence spectra of plastic scintillators with triphenylpyrazoline. (Cont.)

and they fall sharply with increasing wavelength. The peaks are strongest for 0.01%, weakest for 1% of TPP. When 0.5 mm thick, β-ray excited, samples are used another sharp peak appears at about 320 mμ in 0.01% TPP samples, and a low peak at about 300 mμ in 0.1% TPP samples. Subsidiary experiments (comparison with the luminescence spectra of pure polystyrene and the absorption spectra of pure polystyrene and of TPP) show clearly that these peaks are due to polystyrene. Consideration of the mechanism of energy transfer between polystyrene and TPP indicates that a photon process of absorption of the polystyrene luminescence by the TPP molecules is of secondary importance. No less than 80% of the TPP luminescence even at 0.1% concentration, is due to a radiationless process of energy transfer. There are 8 figures, 2 tables and 12 references, 4 of which are Slavic.

SUBMITTED: August 30, 1956.
AVAILABLE: Library of Congress

Card 2/2

ROZMAN, I.M.; TSIMMER, K.G.

Luminescent isodosograph. Vest.rent. i rad. 32 no.2:58-65 Mr-Ap '57.
(MLRA 10:8)
(RADIOLOGY, apparatus and instruments,
luminescent isodosograph (Rus))

ROZMAN, I.M.

Certain problems of improving the current technical equipment of radio communications, radiobroadcasting, and television. Izv.vys. ucheb.zav.; radiotekh. no.3:379-380 My-Je '58. (MIRA 11:7)

1.Starshiy inzhener Kiyevskoy direktsii radioveshchaniya i radiosvyazi.
(Radio--Equipment and supplies)

Sov/51-4-4-21/24

AUTHOR: Rozman, I.M.

TITLE: Theory of Quenching of Fluorescence in Solutions (K teorii tusheniya fluorestsentsii rastvorov)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 4, pp 536 - 538 (USSR).

ABSTRACT: Sveshnikov (Ref 1) criticised the mathematical calculations of quenching of fluorescence of solutions of organic substances developed by Förster (Ref 2) and Galanin (Ref 3). The present author draws attention in this note to another method of calculation of fluorescence quenching which is based on the Markov method (Ref 4). This method is based on the following assumptions. Let a solution contain molecules of substance M_1 which are excited directly by external illumination and molecules M_2 to which energy of electron excitation of M_1 can be transferred. As in Refs 1 and 2, we shall regard the reverse process of energy transfer from M_2 to M_1 to be impossible and we shall assume that molecules are stationary during the lifetime of the excited state and are distributed randomly throughout the solution. Probability of transfer of energy from M_1 to M_2

Cardl/2

depends on the optical constants of the molecules involved, on the distance between them and on the refractive index of the solvent. The present author deduces a decay law and a formula for the quantum yield of fluorescence, which are identical with those obtained in Refs 2 and 3. There are 5 references, 2 of which are Soviet, 2 German and 1 translation of Indian work into Russian.

SUBMITTED: August 16, 1957

1. Fluorescence--Theory

SOV/51-5-1-7/19

AUTHORS: Andreyashchev, Ye.A., and Rozman, I.M.

TITLE: The Absolute Yield of Luminescence of Plastic Scintillators Excited with γ-Rays (Absolyutnyy vykhod lyuminestsentsii plastmassovykh stsintillyatorov pri vozbuzhdenii γ-luchami)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 1, pp 39-43 (USSR)

ABSTRACT: The mean energy yield of γ-luminescence may be written as V = F/D, where F is the total intensity of primary luminescence due to scintillator molecules and D is the integral dose due to γ-rays. For accurate measurement of F a photometric sphere has to be used. Even then some of the emitted photons are lost because of absorption in the scintillator itself and these have to be allowed for in calculations. The authors used a photometric sphere described in Ref 5 together with a FEU-S photomultiplier. The apparatus is shown in Fig 1. Plastic scintillators were used which consisted of polystyrene with a mixture of 1,1,4,4-tetraphenylbutadiene-1,3 (1.5% by weight). The scintillators were in the form of spheres 5-9 mm in diameter. Luminescence was excited by a constant beam of γ-rays from Co^{60}. The samples were placed in a "Plexiglass" container whose external dimensions assured absence of total reflection at its surface. The results of measurements of the energy yield V for

Card 1/3

five scintillators of various sizes are given in the tabls on p 42 (last column). Extrapolation of B to zero scintillator mass is shown in Fig 3. This figure indicates that self-absorption is small. The mean absolute energy yield of luminescence for the scintillator investigated was found to be 0.038 (or 3.8%) under γ-ray excitation. There are 3 figures, 1 table and 16 references, 7 of which are American, 7 Soviet and 2 English.

SUBMITTED: August 16, 1957

Card 2/2

1. Plastics - Luminescence 2. Luminescence - Quantitative analysis
3. Gamma rays - Applications 4. Photometry - Applications
5. Photomultipliers - Applications 6. Cobalt isotopes (Radicactive) - Applications

SOV/51-6-1-11/30

AUTHORS: Kilin, S.F. and Rozman, I.M.

TITLE: On the Law of Irradiation Extinction of Polystyrene Excited by Electrons (O zakone vysvechivaniya polistirola pri vozbuzhdenii elektronami)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 6, Nr 1, pp 65-69 (USSR)

ABSTRACT: The author studied emission by polystyrene which is used as the basis of plastic scintillators. Duration of emission was determined by means of a phase fluorometer with a modulated 30 kV electron beam (Ref 7). The "fluorometric" time constant is given by $\tau_{fl} = (\tan \varphi)/\omega$ where φ is the phase shift between emission and excitation and ω is the frequency of modulation of the exciting radiation. If fluorescence decays exponentially τ_{fl} is independent of ω and is equal to the mean duration of emission τ. This makes it possible to check whether the decay law is exponential by measuring φ at various values of ω. It was found (Table 1) that τ_{fl} does depend on ω, i.e. emission of polystyrene excited with electrons obeys a non-exponential law of decay. Decrease of τ_{fl} with increase of ω (Table 1) contradicts Birks's theory of

Card 1/2

On the Law of Irradiation Excitation of Polystyrene Excited by Electrons

radioluminescence (Refs 1, 9), according to which τ_{fl} should increase with ω. The experimental results given in this paper agree satisfactorily with an assumption of bimolecular mechanism of quenching. The authors point out that the experimental data do not contradict a different assumption, i.e. that there are several components of fluorescence in polystyrene which decay exponentially with different constants τ. There are 1 figure, 2 tables and 17 references, 7 of which are Soviet, 7 English, 2 German and 1 translation.

SUBMITTED: February 13, 1958

Card 2/2

AUTHOR: Rozman, I. M. 48-1-8/20

TITLE: Plastic Scintillators (Plastmassovyye stsintillyatory).

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1958, Vol. 22, Nr 1, pp. 36-40 (USSR).

ABSTRACT: A survey is given here on the development of plastic scintillators both at home and abroad. Their elaboration began in 1950. The first works by Schorr and Torney (reference 1) and the further works from abroad are shortly mentioned. The methods employed at present for their production by means of polymerization are mentioned. There then follows a short survey on the works concerning the investigation of the luminescence of plastic scintillators in the case of excitation by ionizing radiation. The opinions existing in publications concerning the problem of the development of a displacement of the excitation-energy from the base-molecules to the molecules of the luminescing addition are given. The advantages of plastic scintillators for practice are enumerated and the importance of their further investigation is emphasized.
There are 36 references, 15 of which are Slavic.

AVAILABLE: Library of Congress.

Card 1/1 1. Crystals-Excitation 2. Crystals-Energy 3. Crystals-Luminescence

AUTHOR: Rozman, I. M., 48-1-12/20

TITLE: The Dependence of the Luminescence-Yield in Plastic Scintillators on the Basis of Polystyrene on Temperature (Zavisimost' vykhoda lyuminestsentsii plastmassovykh stsintillyatorov na osnove polistirola ot temperatury)

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1958, Vol. 22, Nr 1, pp. 50-59, (USSR)

ABSTRACT: First the apparatus for the measurement of radioluminescence and that for the measurement of photoluminescence are described. In the former apparatus the preparation Po^{210} was used as a source for α-particles. Radiation only takes place at the moment of measuring. During the other period a screen was placed between the preparation pushed back and the sample. In this manner 1) avoided damage to the sample by α-radiation (reference 15), 2) excluded the influence of atmospheric luminescence (references 16-18) was excluded, and, 3) the temperature-dependence for the α- and γ-excitation was measured in one experiment. The Co^{60}-preparation with an activity of about 7 mCu was inserted into the aperture in the sample-holder during the measurements by means of a special holder. Most of the investigations were

Card 1/4

performed with plastic scintillators-(PS) with additions of 1,1',4,4'-tetraphenylbutadiene-1,3,1,3,5-triphenyl-pyrazoline--Δ^2 and anthracene; The concentration of the additions lay between $1.10^{-4} \div 3.10^{-2}$ (according to their weight). Pure polystyrene was also investigated. The samples were 10 mm thick and had a diameter of 16 mm. Excitation of the luminescence was carried out by means of γ-rays or Co^{60}. The intensity of the luminescence was measured with a photomultiplier ФЭУ-19. In the first apparatus the temperature-dependence of the luminescence-intensity of the samples of pure polystyrene was measured in the case of excitation by α- and by β-particles, in the second apparatus in the case of excitation by ß-particles and the line λ = 253,7 mμ Agreement of data was obtained for all 4 exciters. The increase in the intensity of luminescence at a temperature drop may as well be brought into connection with an increase in the yield of luminescence as with a decreases in self-absorption which amounted to about 70% in the investigated samples. These two effects were separated and it was shown that the yields of photo- and radio-luminescence in polystyrene depend on temperature in the same way (reference 19). The temperature-dependence of the ex-

ternal yield of luminescence in a PS with TPP (triphenylpyrazoline) differs considerably from that in pure polystyrene (reference 19). The I(T)-curve in a PS is considerably flatter than in polystyrene. In this connection the steepness of the temperature-dependence of the luminescence-intensity decreases with an increase in concentration in the addition. Besides, the relative course of I(T) depends on the kind of excitation-radiation. The practically complete independence of the yield of photoluminescence on temperature in the case of an excitation with λ = 366 mμ (reference 19) shows that the temperature-dependence found here must in the three other radiations (β-, α- and λ = 254 mμ) be brought into connection with the temperature-dependence of the quantum yield in polystyrene and the process of enery-migration in the PS. - The temperature-course in the luminescence-intensity of scintillators with TPP (tetraphenylbutadiene) just as in a PS with TPP is dependent on the concentration of the addition and the kind of axcitation-radiation. Besides, a clearly marked drop of the intensity of radioluminescence occurs here in the range of low temperatures, especially in a PS with higher addition-concentration. - In the PS

The Dependence of the $L_u$minescence-Yield in Plastic Scintillators on the Basis of Polystyrene on Temperature 48-1-12/20

with anthracene the concentration-effect is less marked than in the afore-mentioned types of scintillators. In the temperature range above 480°K the temperature-course of I(T) differs very little in the case of α- and γ-excitations. The data hitherto given refer to the temperature drop. An increase in the temperature of previously cooled samples was accompained by a number of new effects. In the investigation of the dependence of transmissivity in polystyrene on temperature it was found that on heating of a previously cooled sample the transmissivity in the range 200 ÷ 210°K rapidly decreases. This decrease is only temporary and disappears in the course of a further rise in temperature. Transmissivity was measured at λ = 310 mμ. The same effect is also observed at λ = 410 mμ. - The tests confirm the occurrence of a radiationless migration of the excitation-energy from polystyrene to the additions. It is shown that the duration of luminescence and the illumination with temperature are determined by certain processes in polystyrene itself and not in the luminescence-additions. There are 9 figures, 3 tables, and 28 references, 13 of which are Slavic.

AVAILABLE: Library of Congress

Card 4/4 1. Crystals 2. Crystals-Radiation 3. Crystals-Luminescence

AUTHOR: Rozman, I. M. 48-1-13/20

TITLE: On the Damage Done to Plastic-Scintillators by Ionizing Radiations. II. (Povrezhdeniye plastmassovykh stsintillyatorov ionizuyushchimi izlucheniyami. II.).

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1958, Vol. 22, Nr 1, pp. 60-66 (USSR).
Received: March 8, 1958

ABSTRACT: Part I. see in the periodical "Atomnaya energiya", 1, 54 (1957). In the present paper the author investigated the kinetics of the damage in polystyrene scintillators with additions of 1,1', 4,4'-tetraphenylbutadiene (TPB) and with additions of p-terphenyl (pT) + TPB (reference 9) on radiation of them by α-particles of Po^{210} and β-particles of Ce^{144}. The method of investigation and the fundamental test results are given in reference 10. In all samples a decrease in the intensity of luminescence was observed with an increasing dose of radiation (obtained by the scintillator). At the same time, although somewhat more slowly, a decrease in the light-transparency of the luminescence takes place (the samples become yellow). No change of the spectra was observed in the scintillators investigated. An additional light-absorption in irradi-

Card 1/4

ated polystyrene decreases with an increase in wave-length, which is qualitatively in agreement with the results obtained on radiation of technical polystyrene by γ- and X-rays. In this connection in the case of all wave-lengths the transmissivity T(D) follows the simple exponential law (at $T \gtrsim 0{,}4$), i.e. the coefficient of the additional absorption is proportional to the dose: $\mu_\lambda = K_\lambda D$. D is the dose. The additional light-absorption of the TPB-luminescence in polystyrene with additions is the same as in pure polystyrene. An additional absorption in scintillators irradiated with β-particles is also expressed by an exponential law. But two new phenomena occur here. 1.) During long breaks in irradiating transmissivity is partially restored (the samples were stored in the dark at room temperature). 2.) In the first section of the radiation after the break) transmissivity decreases somewhat more rapidly. After "equilibrium" has been attained the coefficient of the additional absorption in the TPB-luminescence is 8 times smaller than in irradiation with α-particles. The yield of α-luminescence in polystyrene in the case of a damage by α-particles for a dose of $D \lesssim 5 \cdot 10^{10}$ Erg g^{-1}

follows the formula

$$(6) \ldots\ldots B(D) = \frac{B_o}{1 + A_o D}, \text{ where } A_o = 2{,}36 \cdot 10^{-10} \text{ g Erg}^{-1},$$

i.e. it follows the same law as the yield of organic monocrystals. The shape of the $B_\alpha(D)$-curves in polystyrene with additions is markedly different from (6). The great decrease in the luminescence-intensity in pure polystyrene with increasing dose proves that the part played by the products causing the damage is not only restricted to the absorption of photons which are emitted by polystyrene. The relation determined (6) permits the assumption that the process in the extinction of the luminescence of polystyrene is similar to that in anthracene and consists in the competition of photon-emission by the excited polystyrene-molecules and the excitation-energy-migration to the damaged molecules in whom this energy is dispersed. In polystyrene with addition of luminescence-substances matters are more complicated. It is shown that the yield of luminescence of a scintillator with 1,5% TPB, in the case of excitation by the line $\lambda = 366$ m

 decreases more slowly than in excitations by α-particles and

the line $\lambda = 254$ m . In the case of a continuous interruption of a irradiation with β-particles a partial restoration of the luminescence-yield takes place. After the interruptions a rapid decrease in the yield is noticed. - In the case of an excitation by β-particles of the previously irradiated scintillators on a polystyrene basis a longer luminescence occurs. Its extinction takes place in the course of minutes and does not follow the exponential law. The relative intensity of the extinction increases with the dose. In the case of excitation by α-particles the authors did not notice such a long luminescence. - These scintillators can be used for measurements in fairly strong fields with ionizing radiation (reference 10). There are 5 figures, 2 tables, and 15 references, 3 of which are Slavic.

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1. Crystals 2. Crystals-Radiation 3. Polystyrene-Luminescence

Card 4/4

ROZMAN, I. M.

AUTHORS: Andreyeshchev, Ye. A., Baroni, Ye. Ye., Kovyrzina, K. A., Rozman, I. M., Shoniya, V. K. 48-1-14/20

TITLE: Plastic-Scintillators on a Polystyrene Basis. II. (Plastmassovyye stsintillyatory na osnove polistirola. II.).

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1958, Vol. 22, Nr 1, pp. 67-69 (USSR).
Received: March 8, 1958

ABSTRACT: First the method of producing the scintillators is described. The organic luminescence-additions were synthetically produced in the authors' laboratory and carefully purified. Luminescence was excited by β-radiation of Ce^{144}-Pr^{144}. The intensity of luminescence was determined according to the mean current of the photomultiplier ФЭУ-19. The efficacy of a scintillator with 1,5 g 1,1', 4,4'-tetraphenylbutadiene-1,3 in 100 g polystyrene was assumed as 100. The highest efficacy was found in scintillators with an addition of p-terphenyl (~3%) and 2,5-diphenyloxazole-1,3 (~1,3%). The data given do not make it possible to draw quite unique conclusions as to the radioluminescence-yield of the scintillators as well as such on the relative quantity of the quantum yield in the fluorescence of the additions. In order to be able to compare the yield

Card 1/2

Plastic-Scintillators on a Polystyrene Basis. II. 48-1-14/20

of radioluminescence, it is necessary to make corrections concerning the spectral sensitivity of the recording device and concerning the reabsorption in the sample itself. It is shown that external the scintillators with p-terphenyl as basic addition and tetraphenylbutadiene and triphenylpyrazoline as spectrum-shifters possess the highest external yield of luminescence. Heterocyclic compounds of Δ^2-pyrazolines show a fairly high quantum yield. Besides the quantum-yield of fluorescence, the efficacy of the transfer of excitation-energy from polystyrene to the luminescence-additions plays an important part in plastic scintillators. There are 1 figure, 2 tables, and 5 references, 5 of which are Slavic.

AVAILABLE: Library of Congress

1. Chemistry 2. Cyclic compounds 3. Luminescence

Card 2/2

SOV/120-59-2-16/50

AUTHORS: Kilin, S.F., Prosin, G.P., and Rozman, I.M.

TITLE: A Multi-frequency Phase Fluorometer with Double Frequency-Changing (Mnogochastotnyy fazovyy fluorometr s dvoynym preobrazovaniyem chastoty)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 2, pp 57-59 (USSR)

ABSTRACT: Much progress has recently been made in fluorometry directed to fast processes. Sensitivities of 2×10^{-11} sec have been attained (Ref 1), which are not accessible with pulse techniques applied to photomultipliers and oscilloscopes. Phase fluorometers measure the fluorescence time τ_f, which is defined by

$$\omega\tau_f \equiv \operatorname{tg}\varphi = \int_0^\infty R(t) \sin \omega t \, dt \Big/ \int_0^\infty R(t) \cos \omega t \, dt,$$

where φ is the phase shift between the emitted and exciting fluxes, ω is the modulation frequency, and R(t) is the fluorescence decay law. In general, τ_f is a function of ω; only if the decay is exponential law is τ_f independent of frequency and the same as the mean life of the fluorescence τ. The decay law cannot be established unambiguously by measuring τ'_f at different

Card 1/6

frequencies (Ref 2), but such measurements can be used to determine whether the decay is exponential, and to test any proposed decay law. Strictly speaking, only unperturbed molecules fluoresce exponentially. Quenching agents cause the decay to deviate from exponential (Refs 3-5). Bimolecular quenching occurs when the emission is excited by ionizing radiation with a heavy ionization density; the decay law is then much affected (Refs 6,7). Scintillations excited in this way show an initial sharp peak, which passes gradually into an exponential decay. If primary photons play a major part in the scintillation (Ref 8), the photon cascades these primaries produce must give a decay curve that shows an initial rising section. Attempts to establish the decay curve for anthracene have given entirely contradictory results (Refs 9,10). If the modulation frequency is not too low, i.e. if $\sin \omega t$ (or $\cos \omega t$) has time to change appreciably during the mean decay time, t_m, τ_f is sensitive to the shape of the decay curve, and the shape of the $\tau_f(\omega)$ spectrum may be used to indicate roughly the form of the decay curve. The phasemeter system